Metasys® System Extended Architecture Overview Technical Bulletin

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Document Introduction

This document introduces the components and capabilities of the Metasys® system extended architecture. It also describes how the system operates and provides an overview of the various configurations.

Related Documentation

The documents in *Table 1* contain information related to the features, installation, operation, configuration, and troubleshooting of the Metasys system extended architecture. Important user information is located in the Metasys system *Help (LIT-1201793)*.

Table 1: Related Documentation

For Information On	See Document	LIT or Part Number
Features, Benefits, and Specifications of the Application and Data Server (ADS)/Extended Application and Data Server (ADX)	*Application and Data Server (ADS/ADX) Product Bulletin*	*LIT-1201525*
Features, Functions, and Applications of the Network Automation Engine (NAE) 35, NAE45, NAE55, and NAE85 in the Metasys System, Including Technical Specifications and Ordering Information	*Network Automation Engine (NAE) Product Bulletin*	*LIT-1201160*
Features, Functions, and Applications of the Network Integration Engine (NIE) 55 and NIE85 in the Metasys System, Including Technical Specifications and Ordering Information	*Network Integration Engine (NIE) Product Bulletin*	*LIT-1201537*
Features, Functions, and Applications of the Network Control Engine (NCE) 25 in the Metasys System, Including Technical Specifications and Ordering Information	*Network Control Engine (NCE) Product Bulletin*	*LIT-12011283*
Features, Benefits, and Specifications of the System Configuration Tool (SCT)	*System Configuration Tool Product Bulletin*	*LIT-1201536*
How to Install and Upgrade the ADS, ADX, and SCT Software; How to Maintain SCT Databases from Multiple Releases; How to Install the Metasys Advanced Reporting System	*ADS, ADX, and SCT Installation and Upgrade Instructions Wizard*	*LIT-12011521*
How to Install the ADS-Lite	*ADS-Lite Installation and Upgrade Instructions Wizard*	*LIT-12011688*
How to Use the Metasys Database Manager to Manage Historical Data on an ADS	Metasys Database Manager *Help*	*LIT-12011202*
How to License Metasys System Extended Architecture Software (ADS/ADX, NxE85, and Others)	*Software License Activator Technical Bulletin*	*LIT-1201654*
How to Install the CCT Software	*CCT Installation Instructions*	*LIT-12011529*
How to Install the Graphic Generation Tool	*Graphic Generation Tool Installation Instructions*	*LIT-12011685*
How to Use the Advanced Reporting System	Metasys Advanced Reporting System *Help*	*LIT-12011312*
How to Use Ready Access Portal UI	Ready Access Portal *Help*	*LIT-12011342*
How to Use Graphic Generation Tool	Graphic Generation Tool *Help*	*LIT-12011697*

Table 1: Related Documentation

For Information On	See Document	LIT or Part Number
How to Configure an ADS/ADX to be Site Director, Use ADS Repositories, Synchronize Time, Use a Network Printer, Accept Dial-Up Connections, and More	*ADS/ADX Commissioning Guide*	*LIT-1201645*
How to Apply, Mount, Wire, Set Up, and Start the NAE35 and the NAE45, Including Technical Specifications and Ordering Information	*NAE35/NAE45 Installation Instructions*	*Part No. 24-10050-6*
How to Apply, Mount, Wire, Set Up, and Start the NAE55 and NIE55, Including Technical Specifications and Ordering Information	*NAE55/NIE55 Installation Instructions*	*Part No. 24-10051-0*
How to Apply, Mount, Wire, Set Up, and Start the NCE25, Including Technical Specifications and Ordering Information	*NCE25 Installation Instructions*	*Part No. 24-10143-63*
How to Set Up an NAE35, NAE45, and NAE55 for Network Connectivity and Access the NAE User Interface to Set the Basic Parameters	*NAE Commissioning Guide*	*LIT-1201519*
How to Set Up an NAE85/NIE85 for Network Connectivity and Access the NAE85 User Interface to Set the Basic NAE85 Parameters	*NxE85 Commissioning Guide*	*LIT-12011044*
How to Set Up a LonWorks® Control Server (LCS) 85 for Operation on the Metasys® Network	*LCS85 Commissioning Guide*	*LIT-12011568*
How to Use the SCT, Including Setting Up Archive Databases Offline and Basic N2 Online Network Setup	*SCT Technical Bulletin*	*LIT-1201534*
N1 Migration with an NIE	*N1 Migration with the NIE Technical Bulletin*	*LIT-1201535*
How to Integrate an N2 Network into the Metasys System	*N2 Integration with the NAE Technical Bulletin*	*LIT-1201683*
How to Install the NAE/NIE Update Tool and Update NxEs From One Release to Another	*NAE/NIE Update Tool Technical Bulletin*	*LIT-12011524*
Network Information (Including Security Risks)	*Network and IT Guidance for the BAS Professional Technical Bulletin*	*LIT-12011279*
	Network and IT Considerations for the IT Professional Technical Bulletin	*LIT-1201578*
How to Apply and Engineer a Metasys Smoke Control System that Complies with the Metasys System UL 864 (UUKL) Ninth Edition Smoke Control Listing	*Metasys System UL 864 UUKL Ninth Edition Smoke Control System Technical Bulletin*	*LIT-12011252*
Devices and Logic Used to Implement a Ninth Edition Smoke Control System for Single Story Mall, Warehouse, and Multistory Building	*Metasys System UL 864 UUKL Ninth Edition - Standard Smoke Control Applications Application Note*	*LIT-12011308*
How to Integrate a Fire System into the Metasys Network	*Metasys System Extended Architecture Fire System Integration Using the IFC BACnet® Gateway Application Note*	*LIT-1201993*

Table 1: Related Documentation

For Information On	See Document	LIT or Part Number
NAE Compliance with American National Standards Institute (ANSI)/American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE) Standard 135-2004, BACnet® Protocol	*NAE/NCE Protocol Implementation Conformance Statement Technical Bulletin*	*LIT-1201532*
NIE Compliance with ANSI/ASHRAE Standard 135-2004, BACnet Protocol	*NIE Series Protocol Implementation Conformance Statement Technical Bulletin*	*LIT-1201672*
How to Install and Use the Metasys System Remote Access Application for Dial-Up Connections to Shorten the UI Access Time	*Metasys System Extended Architecture Remote Access Technical Bulletin*	*LIT-1201691*
How to Use Web Service Technology for Secure Access to the Metasys System Extended Architecture	*Metasys System Extended Architecture Secure Data Access DLL Technical Bulletin*	*LIT-1201663*
How to Create and Modify Users and Roles, Configure User Profiles, Assign System Access Permissions, Assign All Items Navigation View Permissions, and Unlock User Accounts	*Security Administrator System Technical Bulletin*	*LIT-1201528*
How to Set Up an MS/TP Communications Bus	*MS/TP Communications Bus Technical Bulletin*	*LIT-12011034*
How to Set Up an NAE as a BACnet/IP or BACnet MS/TP System Integrator in a Metasys Network	*BACnet Controller Integration with NAE/NCE Technical Bulletin*	*LIT-1201531*
How to Set Up an NAE or LCS85 as a LonWorks Network Integrator	*LonWorks Network Integration with NAE and LCS Technical Bulletin*	*LIT-1201668*
Direct Serial Connections and Dial-up Modem Connections between NAE/NIEs and a Computer Running Microsoft® Windows 7 Operating System (OS) or Windows XP® OS	*Metasys System Extended Architecture Direct Connection and Dial-Up Connection Application Note*	*LIT-1201639*
How to Change a Non-Tunneling NAE55/NIE55 into an NAE55 with N2 Tunneling Capabilities, and Vice Versa	*ToggleTunnel and ChangeModel Technical Bulletin*	*LIT-12011531*
How to Convert an NAE55 to an NIE55, and Vice Versa, Using ChangeModel	*ToggleTunnel and ChangeModel Technical Bulletin*	*LIT-12011531*
How to Configure and Enable the Demand Limiting and Load Rolling (DLLR) Features on the System	*DLLR Technical Bulletin*	*LIT-12011288*
How to Use CCT Software	CCT *Help*	*LIT-12011147*
Features, Benefits, and Specifications of the Ready Access Portal Software	*Ready Access Portal Software Catalog Page*	*LIT-1900538*
How to Use the Ready Access Portal UI	Ready Access Portal *Help*	*LIT-12011342*
ZFR1800 Series Wireless Field Bus System	*ZFR1800 Series Wireless Field Bus System Technical Bulletin*	*LIT-12011295*
TEC Wireless Thermostat Controller System	*TEC Series Wireless Thermostat Controller System Technical Bulletin*	*LIT-12011414*
WRS Series Many-to-One Wireless Room Temperature Sensing System	*WRS Series Many-to-One Wireless Room Temperature Sensing System Technical Bulletin*	*LIT-12011095*

Table 1: Related Documentation

For Information On	See Document	LIT or Part Number
TE-7800 Series One-to-One Wireless Room Temperature Sensing System	*TE-7800 Series One-to-One Wireless Room Temperature Sensing System Technical Bulletin*	*LIT-12011097*
WRZ-7850 One-to-One Wireless Room Temperature Sensing System	*WRZ Series One-to-One Wireless Room Sensing System Technical Bulletin*	*LIT-12011641*

Metasys System Extended Architecture

The Metasys system extended architecture is a Web-based system that allows day-to-day building operators using a Web browser to access the system's User Interface (UI). The Metasys system user experience is a portal into a site. It can be tailored to fit the needs of all potential system users. The user experience provided by the Metasys system can evolve and scale to match the needs of any single facility or campus of multiple buildings. Two variations of the UI are available: Site Management Portal and Ready Access Portal.

The **Site Management Portal** provides real-time and historical data views, extensive alarm management capabilities, and system configuration functions for system administrators or dedicated building operators. The Site Management Portal transforms the raw data from the site and organizes it into a comprehensive set of information management tools and reports. This portal is accessed using Microsoft Internet Explorer® Web browser through an Internet or intranet connection to a Metasys server or engine. The Site Management Portal has all the features one expects from a full function traditional workstation, including:

- pop-up alarm windows
- navigation tree - multiple custom trees can be created to best represent the logical layout of the facility
- dynamic graphics of systems and floor plans that can be zoomed in on to show fine details
- multiple display areas that can be individually sized and controlled
- global search function and sorting capability that helps you find system information within seconds
- the entire user manual available in the Help system

The **Ready Access Portal** software provides a natural, complementary extension of the Metasys Site Management Portal UI. The Ready Access Portal UI provides an intuitive, task-based interface that can be tailored to meet the needs of building tenants and other specialized users. When using a computer or handheld device, you need only a Web browser to connect to the computer running the Ready Access Portal software.

Information Management is an inherent capability of the overall user experience and reporting capabilities. Whether you are logged into the Site Management Portal UI running online reports, using the Metasys Advanced Reporting System, or retrieving data from an engine with the Export Utility, you are transforming the data collected by the system into information you can use to manage your site.

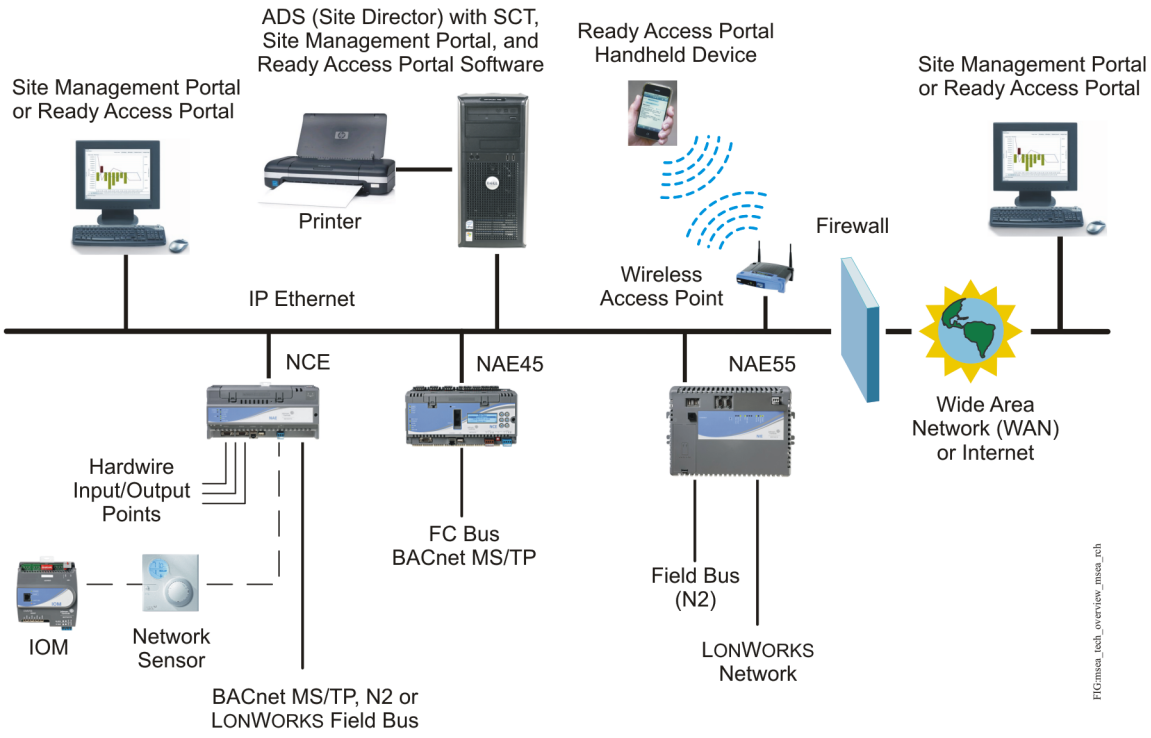
A Metasys site comprises one or more Metasys devices on a continuously connected IP network. A site's primary network consists of one or more engines. The engines also provide the Site Management Portal UI that allows for the configuration of the primary network and user monitoring of all devices on the network. Engines can be Network Automation Engines (NAEs), Network Integration Engines (NIEs), Network Control Engines (NCEs) or LONWORKS Control Servers (LCSs). These engines are described in further detail in this document.

A site can optionally have one or more Metasys servers—computer-based devices that add long-term data storage and support for larger Metasys networks. Metasys servers can be either Application and Data Servers (ADSs), ADS-Lites, or Extended Application and Data Servers (ADXs), which are described in further detail in this document. Servers provide the same Site Management Portal UI as the engines. Additionally, you can install Ready Access Portal software on an ADS/ADX.

Each Metasys site has one device (engine or server) that is designated at the Site Director. Typically, the Site Director is the single point of access for all Site Management Portal UI users because the Site Director includes a view of all Metasys devices on the site. If a server is connected to a site, it must be designated as the Site Director. For more information, see *Site Director*.

Figure 1 shows an example Metasys system configuration. The *Metasys System Configuration Examples* section shows a variety of configuration examples.

Figure 1: Example Metasys System Configuration



Metasys System Extended Architecture Components

ADS and ADS-Lite

The ADS is a Metasys server running on a computer that has a supported Microsoft Windows operating system and two specific components. The first component is the relational database management system using a supported edition of Microsoft SQL Server™ Express software to store collected trend data, audit trail messages, and alarm and event messages with operator annotations. The second component is the Web server software that provides Site Management Portal UI (and optionally Ready Access Portal UI) access to data and routes commands to the Metasys system.

The ADS also:

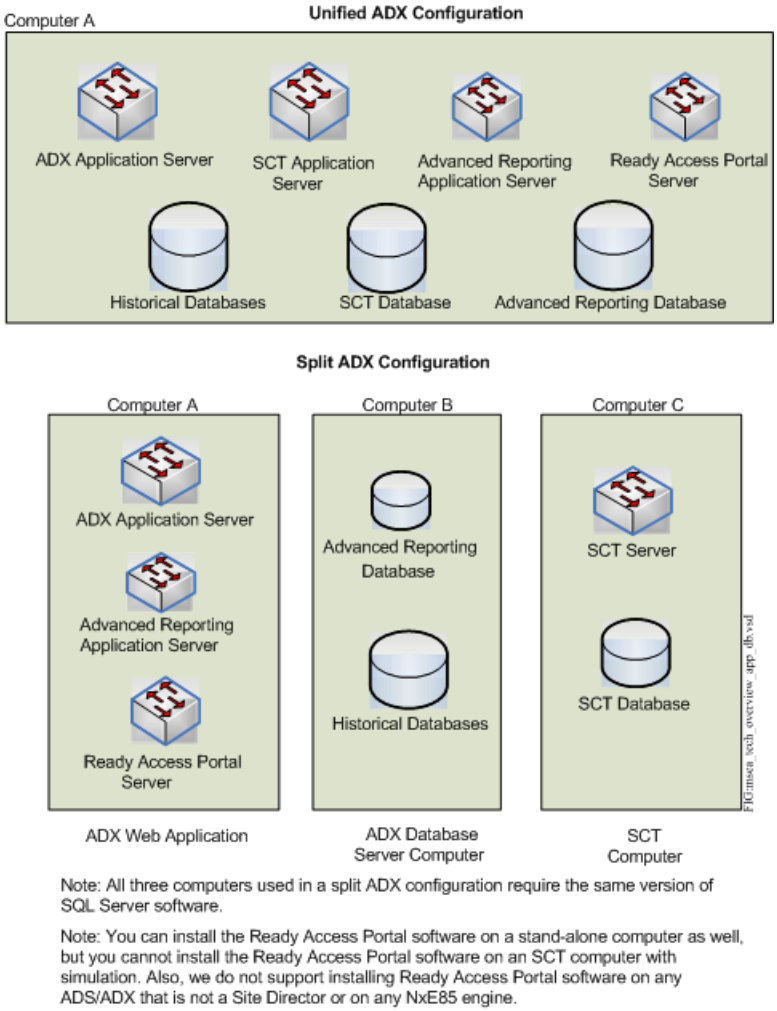
- supports a greater of number engines as a Site Director than an engine supports
- supports multiple, simultaneous international languages at the user interfaces
- allows a greater number of simultaneous users than is supported by an engine
- provides added storage for memory-intensive Metasys features, such as User Graphics

The **ADS-Lite** is a specialized offering that enforces specific localized market connection limitations to other Metasys devices like ADSs and engines. See *ADS-Lite System Requirements* for details.

ADX

The ADX is a version of the ADS with extended capabilities for historical data archiving that expand the multi-user Web access capabilities of the system. The ADX supports the relational database management system that uses a supported edition of Microsoft SQL Server software to store collected trend data, audit trail messages, and alarm and event messages with user annotations. This relational database also stores configuration information for site security, trend studies, and other features. The ADX supports the Metasys Advanced Reporting System, which has a Web-based reporting interface and standard report sets that allow users to review the alarm and trend configuration of their site, run summary and detail reports to monitor alarm and event information, view offline information, combine alarm and audit information in a single report, and aggregate trend data at a summary or detailed level. An ADX can also support the optional Energy Essentials reporting feature, which is an extension of the Metasys Advanced Reporting System.

Figure 2: Unified and Split ADX Configurations


Unified ADX Configuration
Computer A
ADX Application Server
SCT Application Server
Advanced Reporting Application Server
Ready Access Portal Server
Historical Databases
SCT Database
Advanced Reporting Database
Split ADX Configuration
Computer A
Computer B
Computer C
ADX Application Server
Advanced Reporting Application Server
Ready Access Portal Server
Advanced Reporting Database
Historical Databases
SCT Server
SCT Database
ADX Web Application
ADX Database Server Computer
SCT Computer
Note: All three computers used in a split ADX configuration require the same version of SQL Server software.
Note: You can install the Ready Access Portal software on a stand-alone computer as well, but you cannot install the Ready Access Portal software on an SCT computer with simulation. Also, we do not support installing Ready Access Portal software on any ADS/ADX that is not a Site Director or on any NxE85 engine.

The ADX can be installed in a split configuration with the ADX software/Site Management Portal UI on one computer (the Web/Application server computer) and the historical trend, audit, and event data on another computer (the Database server) running Microsoft SQL Server software (*Figure 2*). The SCT, which is used to generate, back up, and restore the network database offline, is installed on a separate computer in split configuration. The Metasys Advanced Reporting System is also available in a split configuration if the SQL Server database components are installed on the Database server and the SQL Server Reporting Services are installed on the Web/Application server. In a split configuration, you can place your database server behind a firewall for an added layer of data protection.

NAE

The NAE is a Web-enabled, Ethernet-based supervisory controller that monitors and supervises networks of field-level building automation devices that typically control Heating, Ventilating, and Air Conditioning (HVAC) equipment; lighting; security; fire; and building access. The NAE provides features including alarm and event management, trending, archiving, energy management, scheduling, and password protection through its embedded Site Management Portal UI. Different models and options support various communications protocols including BACnet over Internet Protocol (IP), BACnet® Master-Slave/Token-Passing (MS/TP), N2 Bus, N2 over Ethernet, and LonWorks® protocol. The following models are available:

- The NAE55 Series supports a comprehensive set of supervisory features and functions for large facilities and technically advanced buildings and complexes.
- The NAE35 and NAE45 Series extend the power of the NAE to the smaller buildings (or small areas of larger buildings) and enable the wider distribution of supervisory functions in larger facilities.

- The NAE45-Lite, available only in specific markets, is a functionally limited NAE45 that cannot be used as a Site Director and functions only with a corresponding ADS-Lite.
- The NAE85 supports large BACnet/IP integrations.

NCE

The NCE combines the network supervisor capabilities and IP network connectivity of an NAE with the Input/Output (I/O) point connectivity and direct digital control capabilities of a Metasys Field Equipment Controller (FEC). The NCE provides a cost-effective solution designed for central plants and large built-up air handler applications. All NCE models provide IP Ethernet network connectivity, the Site Management Portal UI, and the network supervisory functions featured on network automation engines, including the BACnet/IP integration. Depending on the model, an NCE supports either a BACnet MS/TP trunk, an N2 Bus trunk, or a LonWorks network trunk.

NIE

The NIE is a Web-enabled supervisory controller for integration of Metasys N1 networks. The NIE is a specialized version of the NAE and is designed to provide for the migration of existing N1 networks into the Metasys system extended architecture. The NIE provides the same Site Management Portal UI as the NAE. Unlike the NAE, the NIE does not support integration of BACnet MS/TP or BACnet IP, N2, or LonWorks networks. Two models of the NIE are available. The NIE55 supports smaller N1 networks, while the NIE85 supports large N1 integrations.

LCS

The LCS85 is a computer-based server that is used to communicate with LonWorks devices over an IP network. The LonWorks field devices are normally connected to an IP router. This arrangement allows the Metasys system to be used in a flat LonWorks configuration.

SCT

The System Configuration Tool (SCT) assists in all phases of engineering, installing, and commissioning engines and servers in a Metasys system. The SCT can be used offline to create archive databases that can be downloaded to an engine or server. The SCT also allows you to upload and archive databases that were created or modified online from an engine or server. Using the SCT, you can view and configure multiple sites in one archive. The SCT has the same look and feel as the Site Management Portal UI. Two diagnostic reports are available that provide helpful system statistics and list any unbound references found in the database.

The SCT also provides a Simulation feature, which allows you to simulate a functioning engine and test database control logic prior to downloading it. Simulation allows you to perform commissioning and configuring tasks on simulated devices when the Metasys system is offline. In Simulation mode, you can test commands and see how a real system reacts if commanded to perform the same action. The same features are used to commission both simulated and online devices.

The SCT supports commissioning of N2 devices by allowing HVAC PRO software, GX-Tool software, and XTM Configurator software to access the devices on the N2 Bus of an engine. The SCT also supports commissioning of FECs by using Controller Configuration Tool (CCT) software to access the devices on the Field Bus of an engine.

The SCT Manager is a software tool that allows you to use multiple versions of SCT on your computer. This tool is useful when supporting different Metasys sites that have different revisions of installed Metasys software, or a single site that has multiple engines at different software revisions.

CCT

The Controller Configuration Tool (CCT) is used in conjunction with the Metasys system extended architecture user interface to configure, simulate, and commission FECs, Input/Output Modules (IOMs), NCEs, Variable Air Volume (VAV) Modular Assembly (VMA) 16s, and DIS1710 Local Controller Displays on a BACnet MS/TP Bus. You must install CCT on the same computer as SCT software to use the Ethernet Passthru option in SCT.

The CCT includes the ZFR Checkout Tool (ZCT). The ZCT allows you to validate the wireless connectivity and health of wireless devices within a ZFR1800 Series Wireless Field Bus System to help ensure a reliable wireless mesh network is in place.

The CCT is a separate software installation included on the SCT product disk.

Metasys Database Manager

The Metasys Database Manager provides both database management and database monitoring functions, handled in two separate windows. Database management includes summarized information on and methods for backing up, purging, and restoring Metasys system ADS/ADX trend, alarm (event), and audit databases. Monitoring includes an indication of database status compared to three levels of defined database sizes.

Wireless Solutions

Several wireless Metasys solutions are available for integrating wireless connectivity in desired portions of a Metasys network. These solutions provide wireless communication between controllers, thermostat controllers, coordinators, routers, and room sensors.

- ZFR1800 Series Wireless Field Bus System
- TEC Wireless Thermostat Controller System
- WRS Series Many-to-One Wireless Room Temperature Sensing System
- TE-7800 Series One-to-One Wireless Room Temperature Sensing System
- WRZ-7850 One-to-One Wireless Room Temperature Sensing System

These wireless solutions reduce costs by minimizing wiring, provide application mobility and flexibility, and simplify the challenges of difficult or cost-prohibitive installations or renovations. The wireless solutions can coexist with each other, and offer the flexibility of coexisting with hard-wired Metasys solutions.

Metasys System Capabilities

Site Director

When a user accesses any engine or server directly through a Web browser, only the information local to that device is accessible. To make all information in the facility accessible from a single point, the Metasys system uses a Site Director. The Site Director is the device designated to maintain the site information, including the logical organization of data about your facility (called User Views), user password administrative information, and overall master time and date. This function resides in an engine or, on large installations, a server. For networks that do not have a server, one of the engines is designated as the Site Director. When one or more servers are part of the network, one server must be designated as the Site Director. The Site Director provides a uniform point of entry and supports functions such as user logon, user administration, time synchronization, and traffic management.

Consider a server as the Site Director if you require:

- support of multiple international languages
- repository for trend and alarm data and operator transactions, along with annotations for MVE systems
- a greater number of simultaneous users than an engine allows
- additional storage space for graphics

Time Management

The time and date used by all devices connected to a site are synchronized automatically, preventing errors from manual time entry and clocks that become inaccurate over time. Network-wide time management ensures that scheduling, trending, audit trailing, data collecting, time-stamping of alarms, and other functions requiring accurate time management use the same time and date consistently for all system operations. Because the Site Director is the master time keeper for all engines and servers on a single site, all of these devices are assumed to use the same time zone for all time-rated functions.

For network-wide time synchronization, the engine or server acting as Site Director is the time server for the entire site. All other devices are time clients because they receive the time from the Site Director. The Site Director can be configured to use three different methods of time synchronization: Unicast Simple Network Time Protocol (SNTP) (also known as Microsoft® Windows® time synch), Multicast SNTP, or BACnet time synch. The Site Director can also be configured to synch its time from an external Web site.

System Navigation

Users can create customized system navigation schemes in the form of User Views, a hierarchical method of organizing and displaying some or all of the items within a system. A Metasys system administrator can limit a user's access to the Metasys system by creating User Views and assigning them to specific users. User views provide organizational structure and data filtering for the information displayed in the Metasys Advanced Reporting System UI and the Ready Access Portal UI.

Monitoring and Commanding

Monitoring and commanding allows you to efficiently navigate through items associated with your building operations as well as view, analyze, and modify these items. After creating items with wizards, use these features to:

- access, view, and modify item data
- send commands to items
- run reports to analyze item information

Preferences

The Metasys system provides customized preferences for the Site Management Portal. The preferences allow you to configure how the UI behaves, including the sounds and colors, the startup views, alarm priorities, and links from within the UI to external applications. Preferences are divided into two categories: system preferences and user preferences. System preferences apply to all users who log on to the site or device and affect the performance and operation of the system. User preferences apply to a specific Metasys system user and define how information is displayed in the UI. User preferences do not affect the operation of the system.

Alarm and Event Management

The alarm and event feature provides event management for the system and allows you to configure the routing of event messages to destinations such as the server for permanent storage. The Metasys Site Management Portal UI features a pop-up alarms window, which alerts the operator to potential problems whenever the operator is logged on to the system; and an event viewer, which provides for greater analysis or a history of alarms and events in the system. The Ready Access Portal UI features an Alert Summary view, which allows the user to view and acknowledge recent event history.

The Metasys system allows alarms and events to be configured using either a Metasys alarm extension or a BACnet alarm (intrinsic or algorithmic). Metasys alarm extensions generally provide more feature capability and ease of setup, whereas the BACnet alarms provide better interoperability with other BACnet systems.

Note: An event is a notification of a status change in the Metasys system. An alarm occurs when a value defined in an engine goes outside of a user-defined range, changes to a user-defined contact condition, or fails to respond to a command within a user-specified time. When an alarm occurs, an event is generated. Events can be generated by any Metasys platform. For example, if the NAE detects that a network node is offline, it can generate an event. If an error occurs in the server platform, an event can also be generated. Once an event is generated, it is stored in an Event Repository file located on the device that generated the event. You can retrieve and examine events stored in the Event Repository.

Destination Delivery Agents (DDA)

DDAs are the method used for routing and delivering Metasys alarm extension event messages to destinations such as pagers, printers, e-mail, and Network Management systems. The Metasys system uses an e-mail DDA, Pager DDA, Printer DDA, and Simple Network Management Protocol (SNMP) DDA. The e-mail DDA supports standard Simple Mail Transfer Protocol (SMTP), Post Office Protocol (POP), and Internet Message Access Protocol (IMAP).

SNMP provides IP standard SNMP functionality in the Metasys system, enabling network administrators to manage Metasys network performance, find and resolve Metasys system-related issues, and plan for future growth of the Metasys system. SNMP functionality uses standard SNMP Versions 1, 2C, and 3 (excluding SNMP encryption and authentication support). Metasys system allows delivery of unsecured SNMP traps for Metasys alarm events from all engines and servers to the facility owners's Network Management System (NMS), and allows the NMS to execute SNMP Gets against engines. This version of SNMP support does not include the SNMP set commands.

Johnson Controls has developed a downloadable custom dynamic Management Information Base (MIB) that allows the NMS to monitor Metasys point objects, display attributes, and control sequence objects. The MIB is constructed to accurately reflect the additions and deletions of objects in the supervisory devices as the changes occur. The custom MIB defines explicit traps and associated attributes that align with Metasys alarm messages, making data correlation (parsing/sorting) at the NMS straightforward and seamless.

Alarm Printer

Alarms from supervisory devices can be sent automatically to an alarm printer if one is configured and online.

Scheduling

Scheduling provides a graphical user interface that illustrates when events are scheduled to occur. Scheduling automates routine functions, such as transferring a room from occupied mode to unoccupied mode for heating and cooling needs, and energy optimization. Each schedule consists of a weekly schedule, an exception schedule, a list of items in the schedule, and an effective period. Exception schedules take precedence over the daily schedule only for their configured length and then return the schedule to its typical weekly schedule. Exceptions can include references to Calendars that can, for example, reflect a holiday schedule for the entire facility or show selected tenant spaces in the building. Another view within the schedule, called Today's Schedule, shows the current day's schedule including how each exception schedule affects the current day's schedule.

Historical Data Management (Trend)

The Metasys Historical Data Management capability allows you to collect, store, and view historical samples of object data. With the information generated by this feature, you can manage energy usage, prove compliance to standards, and diagnose problems in your facility.

Each engine has a local buffer where it stores trend samples. The size of this buffer, in number of samples, is configurable by the user. If a server exists on the site, you can send the trend samples to its database. This database supports backup, restore, and archival of data to long-term storage. You can display trend data as a graph or table of values on the Site Management Portal UI or more recent historical data can be displayed as a graph or table on the Ready Access Portal UI. Trend data can also be copied to the browser computer's clipboard, allowing the data to be transferred to spreadsheets, databases, and Microsoft Word documents.

Using the Site Management Portal UI, multiple point trends can be shown on a single graph or table, making it easier to detect system-level performance. These multiple trends can either be predefined in a Trend Study, or the user can dynamically select various point trends to display on a single graph using the Trend Viewer. The Site Management Portal UI also offers information on the rate of events, rate of samples, and number of samples that are lost. Refer to the Metasys system *Help (LIT-1201793)*.

Export Utility Software

The Export Utility software provides facility managers with the ability to easily build custom reports using historical data from the Metasys system. This data can be used to manage daily building operations. Export Utility software extracts historical trends, alarms, and audit data from an engine or server. This data can be collected from the system and stored in up to six different formats desired by the operator for analysis, including Microsoft Word or Microsoft Excel. A scheduling feature is also provided to retrieve and save data based upon user-configurable time intervals.

The Export Utility provides the user with the ability to create runtime studies and discover root cause analysis of system changes and mechanical equipment failures. You can also use it to collect trended runtime data for use by a Computerized Maintenance Management System (CMMS) to schedule mechanical maintenance of HVAC systems.

Metasys Advanced Reporting System

The Metasys Advanced Reporting System is a standard capability for all ADXs when using SQL Server 2008 R2 software, SQL Server 2008 software, or SQL Server 2005 software with SQL Server Reporting Services (SSRS) installed. The Web-based reporting interface provides standard report sets to allow users to review the alarm and trend configuration of their site, run summary and detail reports to monitor alarm and event information, view offline information, combine alarm and audit information in a single report, and provide summary and detailed trend aggregations. The report information is filtered by the site's All Items or User View navigation tree. Users can customize the date range and data type desired for each report. Once a report is created in the user interface, the option to export the data into common applications, such as Microsoft Excel spreadsheet or Adobe® PDF formats, is available.

Energy Essentials

Energy Essentials is an optional software feature that can be added to the Metasys Advanced Reporting System. It offers seven types of energy reports that provide a high level view of normalized energy use across your site, and presents your daily electrical demand graphically.

User Graphics

User interaction with the Metasys system can be done using a graphic presentation on the Site Management Portal UI or the Ready Access Portal UI. The User Graphics Tool (UGT) is used to view, create, and edit user graphics. This application provides a way to monitor and control a facility through a graphic representation presented in a functional format.

Advanced Graphics Application Software

The Advanced Graphics Application is an enhanced graphics creation package that provides additional dynamic capabilities, such as custom animation, color changing, and flashing for the Metasys system, which are not supported by Standard Graphics. The package includes a dynamic example stencil library and is an add-on to Microsoft Visio® software. With a more comprehensive representation of facility support systems, building operators can easily monitor the health of the system on a more intuitive interface. Advanced graphics are viewed from the Metasys system Site Management Portal UI.

Graphic Generation Tool

The Graphic Generation Tool (GGT) is the newest graphic creation package for Metasys that takes building control from graphical displays to the next level. This stand-alone application runs on any supported Windows OS computer to deliver an ideal platform for creating sophisticated graphics for your entire facility. A Metasys Graphics Package is included to provide an extensive library of pre-built templates, symbols, controls, and dynamics that you can freely use and customize. Graphics built with the tool are saved to the Site Director or engine as Graphics+ objects and viewed from and interacted with the Site Management Portal UI or Ready Access Portal UI. For best results, we recommend graphic authors use a computer system with two monitors.

System Security

User access to the Metasys system is controlled by user accounts. An account defines which portions of the Metasys data a user can access (for example, all HVAC data or all lighting data from a particular area of the building) and which functions the user can perform on that data, from view-only access to configuring new databases. The Metasys system provides the ability to divide the data into 25 unique categories, including HVAC, fire, and security; and has 10 different levels of user functionality.

User accounts can be further limited to operate only at specified times on specified days of the week. All account settings are created by a System Administrator.

Each account can also have associated preferences, such as which graphic or trend to display when a user logs on to the Site Management Portal UI, or which User Views appear in the Navigation Tree.

Basic Access offers limited operator access to Site Management Portal features based on the user's assigned permissions in the Security Administrator. Basic Access is offered on all the Metasys system engines and servers but is the primary mode of access for stand-alone NAE3514, NAE3515, NAE3524, and NAE3525 models.

Microsoft Active Directory® accounts can be used with the Site Management Portal and Ready Access Portal. In addition to making it easier for system administrators to manage Metasys account access, this feature also provides the ability to use Single Sign-On to access Metasys together with other supported applications on the enterprise network.

All user activities are recorded in the Audit Log, which allows the System Administrator to monitor user actions.

MS/TP Communications Bus

The MS/TP Bus is a local network that connects some NAE/NCEs and field controllers using BACnet MS/TP protocol. Two tiers of MS/TP Buses exist in the Metasys system architecture. The Field Controller Bus (FC Bus) consists of BACnet controllers and point interfaces supervised by an NAE/NCE. The Sensor Actuator (SA) Bus consists of point interfaces and networked sensors supervised by a field controller.

N2 Field Bus

The N2 Field Bus is a local network that links controllers and point interfaces to some NAE/NCE. The N2 Bus uses a master/slave protocol, in which the master device (the NAE/NCE) initiates the communication with the N2 Bus devices.

LonWorks Devices

The LonWorks network links LonWorks devices to some NAE/NCE. The NAE acts as a supervisory controller and communication path to the Metasys system for a network of LonWorks devices. The NAE supports any LonWorks device if the network interface follows the current LonMark® guidelines and uses the Free Topology Transceiver FTT10, including all current LonMark certified devices from Johnson Controls such as:

- LN Series Controllers including programmable controllers, application-specific controllers, and displays and schedulers
- Terminal Control Units (TCUs)
- Programmable NexSys® Flexible System Controllers (FSCs)

An LNS® plug-in tool, such as LN-Builder 3.x, can be configured to work concurrently with the SCT for commissioning a LonWorks trunk and creating import files for the NAE to map the LonWorks objects to NAE objects.

N1 Integration

The N1 integration is based on the NIE. A single NIE or a network of multiple NIE devices are configured to map point objects of all or selected Network Control Module (NCM) devices on one or multiple existing Ethernet N1 networks. The NIE to which an N1 object is mapped provides alarm and event management, trending, energy management, and scheduling capabilities.

P2000 Security Management System Integration

The Metasys system provides integration with the P2000 Security Management System. The P2000 integration offers the following features:

- View and interact with all aspects of HVAC facility operation. For example, floor plan graphics can contain dynamic information about environmental conditions and security status in a common display.
- View P2000 objects in the navigation tree; leveraging the use of a common user browser user interface
- Control output points and doors
- View P2000 events in the Metasys system Event Viewer
- Initiate actions on the Metasys system from P2000 Events

You can define functional interlocks between the P2000 and other systems managed by the Metasys system. For example, employee identification cards can be set to turn on the air conditioning system serving their work areas when they arrive in the building. For information, refer to the *P2000/P2000LE: Metasys System Extended Architecture Integration Option Manual (Part No. 09-9300-01)*.

Logic Connector Tool (LCT)

The Logic Connector Tool (LCT) is used to create custom application programs that execute in any engine. The programs are created using a drag-and-drop editor that allows the programmer to connect real-time point data in the engine with logic blocks that perform mathematical, logical, and various specialized control functions. LCT programs can be created, edited, and viewed online through the Metasys Site Management Portal UI, or offline using the SCT. When viewed through the SCT, the finished programs can be simulated to verify proper operation before being downloaded to the engine.

Interlocking Programs (Event)

The Interlock object provides a means to establish conditional control over one or more other objects. It consists of an If conditional statement, True command statements, and False command statements. Through these statements, the user specifies a set of conditional checks (using one or more points) for which a series of commands is used to control a collection of one or more other objects.

Optimal Start

Optimal Start automatically determines the correct time to start HVAC systems to ensure the facility is ready for occupants at the scheduled time. It adjusts to seasonal variations and minimizes the energy used.

The generic standard object screens handle the Optimal Start/Stop object configuration and focus views. The object defines views for configuration and focus, and the generic screens interpret the views to display the proper fields to the user. No custom screens or handlers are needed.

Demand Limiting and Load Rolling

The Demand Limiting (DL) feature reduces utility bills by limiting peak energy usage. DL electively turns off (sheds) equipment, such as fans and lights, or adjusts setpoints to limit energy use during peak times.

The Load Rolling (LR) feature helps save money by reducing overall energy consumption. LR acts continuously to maintain a specified energy reduction by shedding unnecessary loads. A facility can implement either one or both of these features.

Audit Trails (Transaction Data Management)

The Audit Trail feature records events generated either by user actions or system activity. Examples of user actions include logging into the UI or issuing commands to a point. Examples of system activity include device restart initialization settings or internal security changes. An audit message consists of the information that describes a significant event on the Building Automation System (BAS). For each significant event, a new audit message is generated and appears in the Audit Viewer.

Once an event is sent to the Audit Trails subsystem, an audit message is generated and stored in an Audit Repository file located on the server or engine that detected the condition.

Audit messages may be forwarded from the Local Audit Repository to a user-specified ADS Audit Repository for permanent storage on a server (ADS/ADX), based on user-defined rules.

The Site Management Portal UI contains the Audit Viewer that allows the user to view audit messages. Once a user logs on to the Site Director, the user can view all audit messages from the server or any device that contains a Local Audit Repository. When a user directly logs on to a device not designated as the Site Director, the user can only view audit messages in that device's Local Audit Repository. Any audit messages generated on a server are placed directly into the ADS/ADX Audit Repository.

System Diagnostics and Serviceability

The engine provides collection and storage of diagnostic data. The Diagnostic view of the engine device retrieves and displays diagnostic data related to communications, internal component performance, and other areas.

UL 864 UUKL Ninth Edition Smoke Control Listing and Fire Panel Integration

Components of the Metasys system running Release 4.1 software are Underwriter Laboratories (UL) 864 UUKL Ninth Edition listed for smoke control. In applications requiring smoke control, this offering provides the protection of a UL 864 UUKL listed smoke control system that has a lower installed cost and leverages the operational efficiencies of using a single system to provide HVAC and Fire Alarm smoke control. Earlier versions of the Metasys system also support UL 864 UUKL Eighth Edition. Eighth Edition and Ninth Edition hardware must be isolated from each other via an Ethernet switch to coexist in a building.

The Metasys Smoke Control System consists of a set of hardware components specifically UL Listed for smoke control applications and a smoke control application running in an NAE specifically UL Listed for UL 864 UUKL Ninth Edition smoke control.

The smoke control offering provides a configurable yet straightforward application for receiving fire alarm and smoke control inputs from various systems and allows for the automatic triggering of smoke control schemes. The system also enables a designated operator to execute real-time control from an annunciator panel, the Automation Displays, Incorporated (ADI) UL Listed Firefighter's Smoke Control Station (FSCS), or its primary user interface, based on the specific dynamics of a fire/smoke control event in a building. The system ships with a set of pre-configured standard applications.

Metasys for Validated Environments

Metasys for Validated Environments (MVE), extended architecture is a feature designed for facilities that require regulatory compliance for their environmental systems. The MVE feature operates on an ADX, NAE55, NCE25, and NIE55, which are all supported as validated devices.

MVE is specifically designed to help customers address United States Food and Drug Administration (USFDA) Title 21, Code of Federal Regulation (CFR) Part 11 compliance. MVE is also compliant with other similar agencies around the world that deal with electronic records and electronic signature requirements, such as Annex 11 of the European Union Good Manufacturing Practice (EU GMP) regulations (European Medicines Agency [EMEA] 1998).

The ADX with MVE software provides secure data management and reporting capabilities, traceable electronic records and signatures, and time-stamped audit trails for facilities subject to Part 11 compliance. It manages and protects the long-term storage of trend data, audit data, event/alarm messages, annotations, and system configuration data. In addition, complex passwords and message encryption secure the system from unauthorized access and data tampering.

Metasys System Configuration Examples

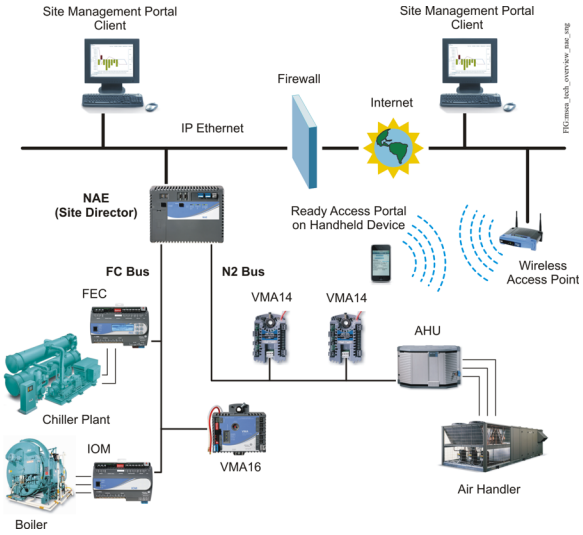
Single NAE System Configuration

Figure 3 shows a single NAE55 device attached to one N2 trunk and one LONWORKS trunk. Once you complete the automated discovery process for both the N2 and LONWORKS trunks, your system is ready to provide supervisory control and Web access to a maximum of four simultaneous users. Graphics access is included; however, it is limited to available storage on the NAE. The Site Management Portal UI can be accessed by connecting the NAE to an Ethernet network and adding a computer with a suitable browser on the network.

Note: This configuration only provides long-term storage of data through the use of the Export Utility installed on a computer.

Note: The NAE45-Lite cannot be a stand-alone engine on a network.

Figure 3: Single NAE Metasys Site Example



Multiple NAE System Configuration with One NAE Designated as the Site Director

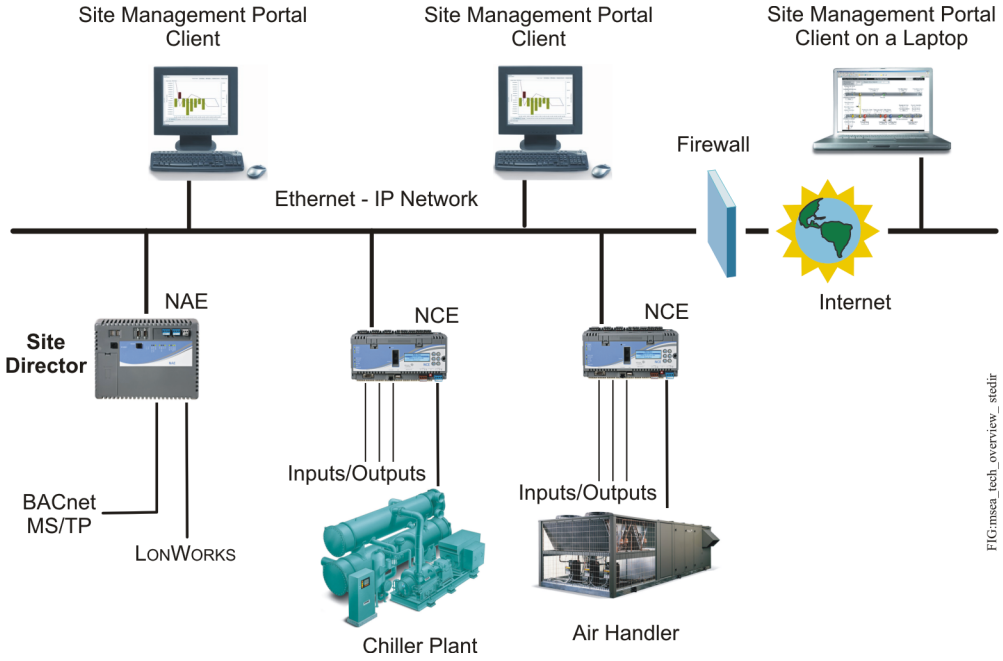
To extend the capabilities of your system, add one or more additional NAEs. In *Figure 4*, one NAE designated as the Site Director, provides the Site Management Portal to all devices on the site. This configuration supports up to four simultaneous users.

Note: The Site Director must contain the modem for a dial-up site.

Note: This configuration only provides long-term storage of data through the use of the Export Utility installed on a computer.

Note: The NAE45-Lite can be partnered with only other NAE45-Lite devices. Additionally, the NAE45-Lite requires an ADS-Lite-A Site Director.

Figure 4: Multiple NAE System Configuration with One NAE Designated as the Site Director



Ready Access Portal Configuration

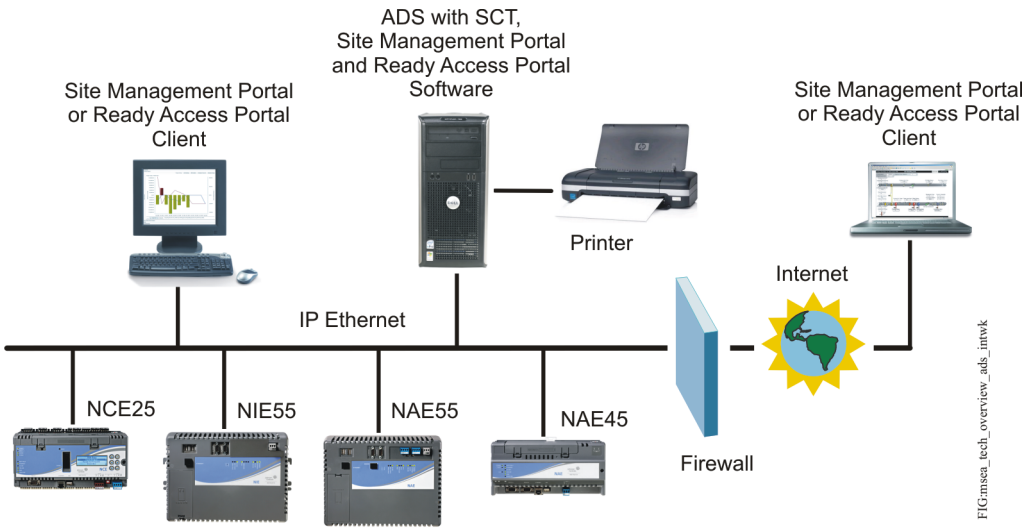
The Ready Access Portal software provides a natural, complementary extension of the Metasys Site Management Portal UI. The Ready Access Portal configuration includes a computer running the Ready Access Portal software, a Metasys Site Director, and a computer and/or handheld device for browsing to the Ready Access Portal UI. The example configuration in *Figure 5* shows a configuration with the Ready Access Portal Software installed on an ADS.

ADS Site Director with Multiple NAEs System Configuration

Sites that require more than four simultaneous users must add an ADS or ADX (*Figure 5*). If a large number of graphics are required to navigate through a site, the addition of the ADS/ADX allows access to a disk drive or network drive for graphic file storage. The ADS/ADX provide permanent storage of collected trend data samples, event messages, and audit trail messages routed from the NAE/NCE devices.

Note: The ADS-Lite is available in select markets and supports a subset of available Metasys system devices.

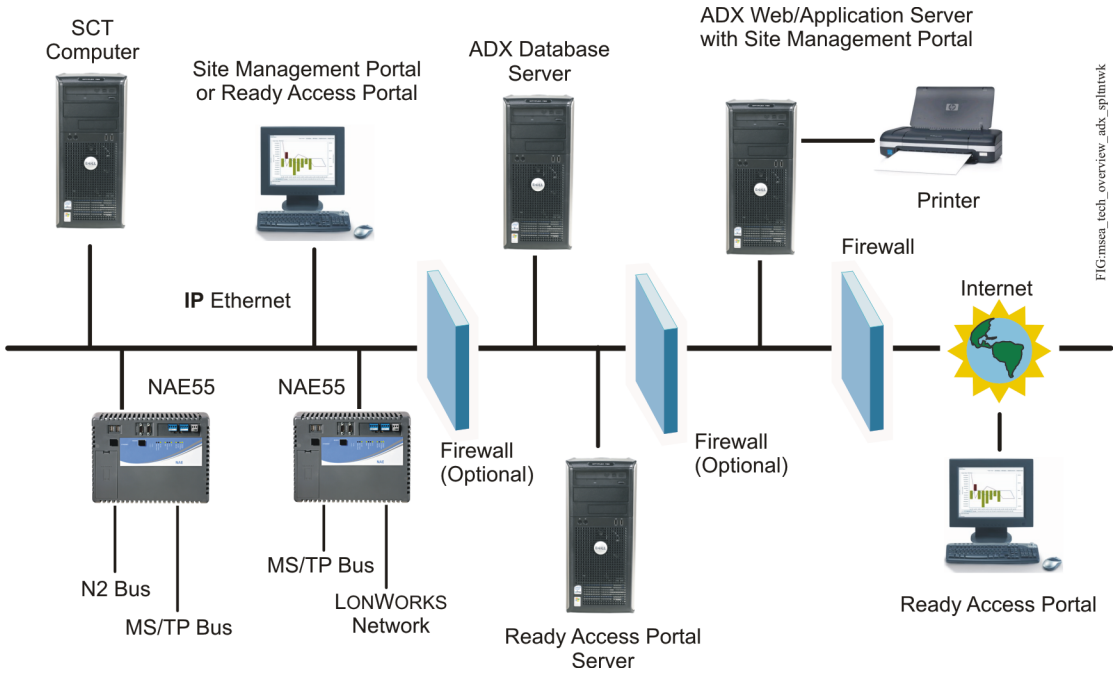
Figure 5: Multiple NAE System Configuration with ADS and Ready Access Portal



ADX Split Configuration

The ADX split configuration provides the ADX software/user interface on one computer (the Web/Application server computer) and the alarm, audit, annotations, and historical trend data on another computer with Microsoft SQL Server software (the Database server computer).

Figure 6: ADX Split Configuration



Large ADX Site Configuration

For a customer site that requires from 200 to 1,000 NxEs, we recommend an ADX configuration with a minimum of two separate servers, one serving as ADX Site Director and repository, and a second for use with configuration tools, such as SCT and the NAE/NIE Update Tool. If the Ready Access Portal software is required, a third server is recommended to run the Ready Access Portal software. See *Table 2*.

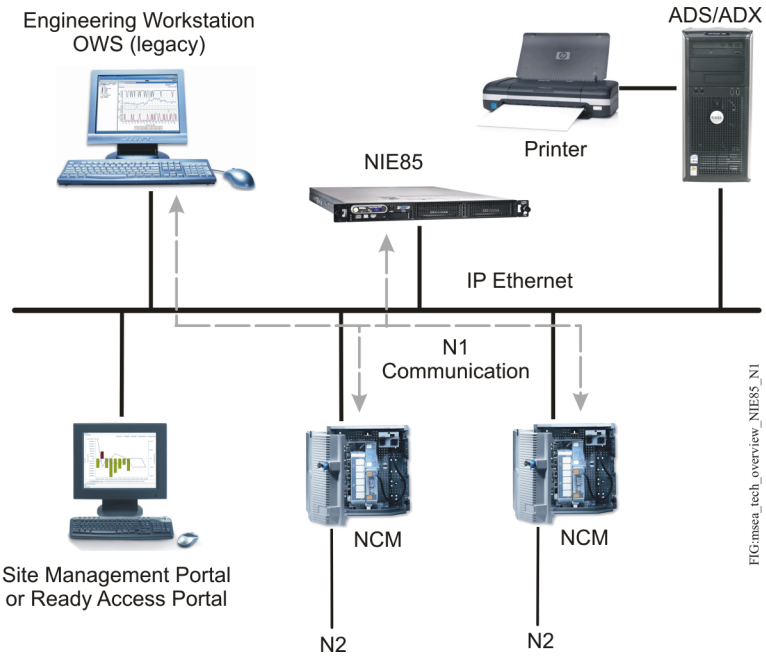
Table 2: Recommendations for Large ADX Systems

Item		Recommendation
Hard Disk		584 GB at 15,000 RPM with 400 GB free
Processor Type		2x Intel® Xeon® Processor E5530, 2.4 GHz, 4 MB Cache RAID Level 5 configuration
Memory		12 GB
Operating System		Microsoft Windows Server 2008 Standard R2 (64-bit)
SQL Server Software		Microsoft SQL Server 2008 Standard R2 (64-bit)
Site Object Settings	Poll Rate	Set to slow.
	Time Sync Method	Select Multicast with heartbeat interval of 60 seconds. Note: To allow multicast packets to reach all NxEs, configure network routers to allow multicast packet passthru. This setting is usually not the default.
	Dynamic Broadcast Management	Depending on the number of network segments and data sharing needs, set Dynamic Broadcast Management to False, and manually set up BACnet Broadcast Management Devices (BBMDs).

N1 Integration System Configuration

The NIE (NIE55 and NIE85) provides a means of migrating your existing Metasys N1 network to the Metasys system.

Figure 7: N1 Integration with NIE85



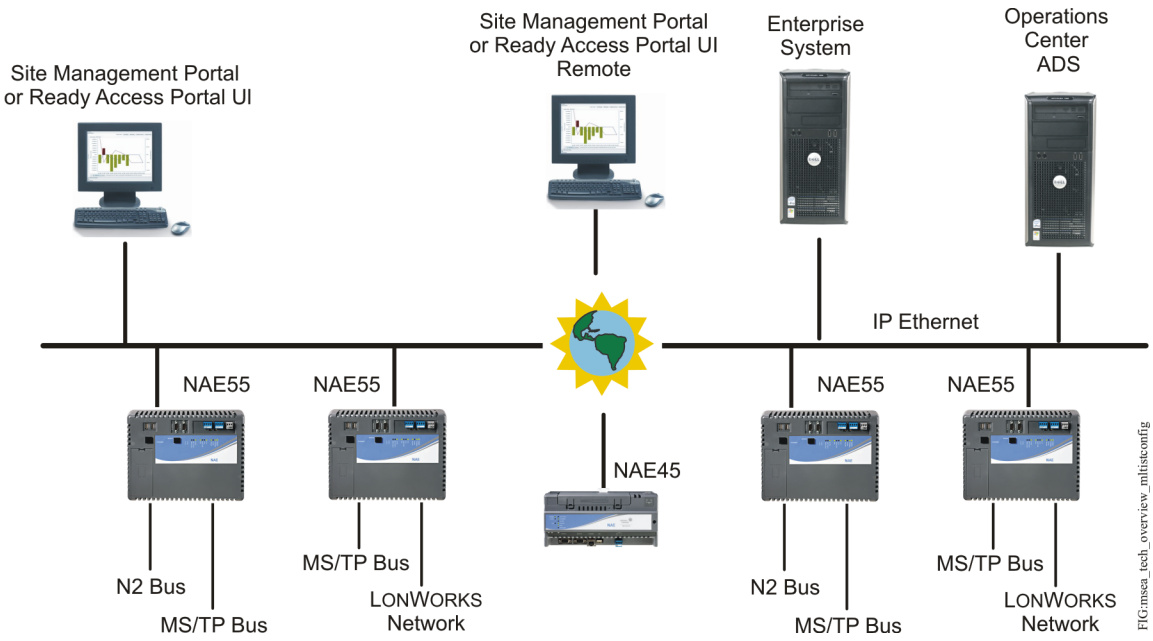
Multi-Location Configuration

Remote sites may be single or multiple NAE configurations, with or without a local ADS/ADX. The remote site may also be a Metasys N1 installation with one or more NIEs to integrate the site into the Metasys system.

The operations center for the multiple sites would normally have an ADS connected to the enterprise IP network and be part of the Virtual Private Network (VPN) for access to the sites that are linked by a WAN. It would also have modems to receive messages from small sites that only have telephone line access.

The application server receives and displays alarm and event messages to the operators and records their response actions. The server retrieves and stores all operational data from the remote buildings for review by management personnel. Enterprise business systems can access the data for further analysis. The building where the Operations Center is located may have its own BAS with a single or multiple NAEs.

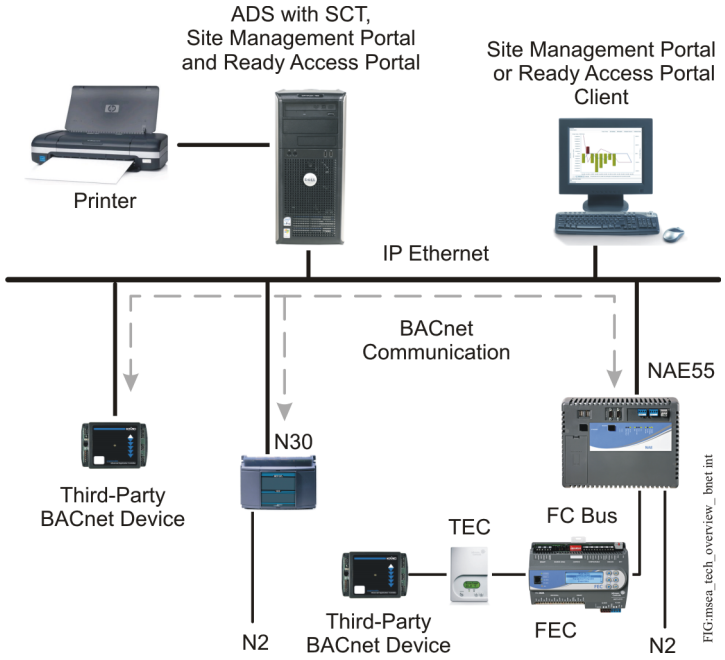
Figure 8: Multi-Location Configuration



BACnet IP Network System Configuration

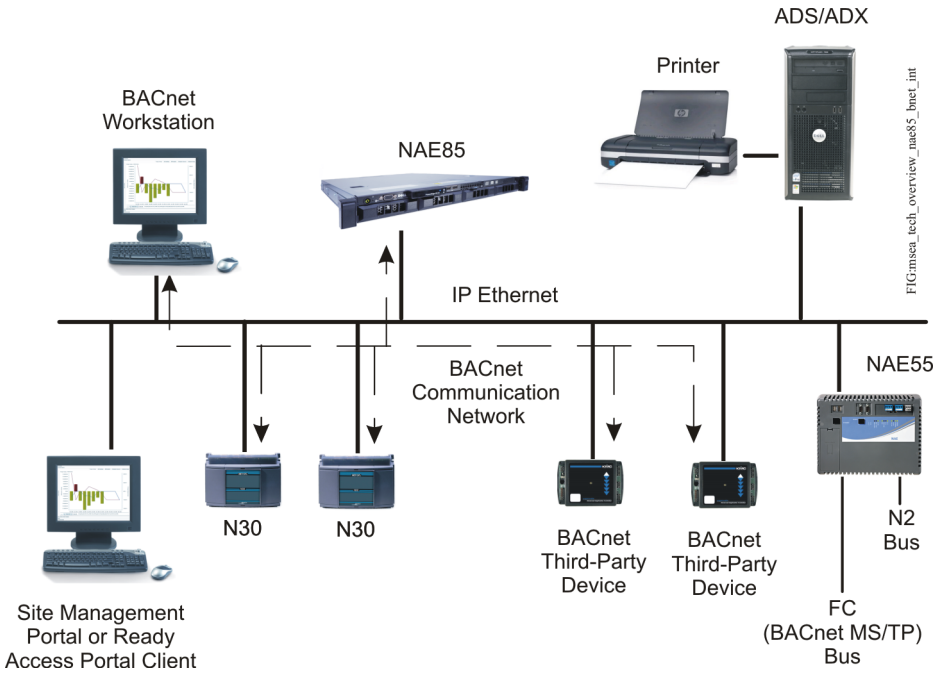
BACnet IP devices are connected directly to the IP Ethernet network. The NAE/NCE communicates with the devices using the BACnet protocol and presents the BACnet data to the system in the same way as the other data in the Metasys system. *Figure 9* shows the N30 supervisory controller integrated into the Metasys network. Other BACnet IP devices are integrated in the same way.

Figure 9: BACnet IP Network Integration System Configuration



The NAE85 allows integration of larger BACnet integration projects.

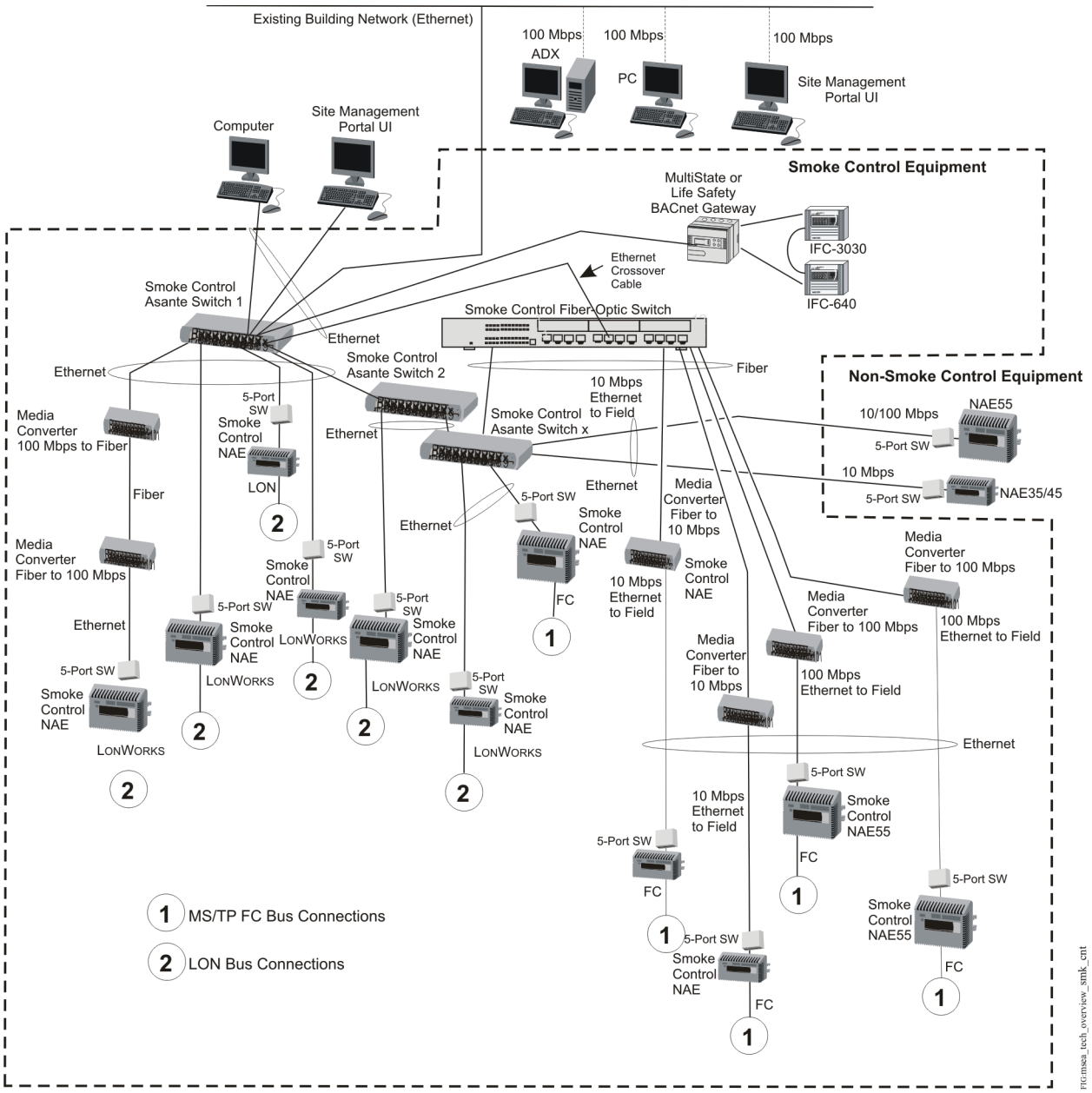
Figure 10: NAE85 BACnet Integration



Smoke Control Application Configuration

Figure 11 shows a configuration that complies with the UL 864 UUKL Ninth Edition listing, incorporating smoke control and non-smoke control systems. *Figure 11* is only an example; the number and arrangement of components in your system may differ. Ensure that your system complies with all device and communication requirements and restrictions.

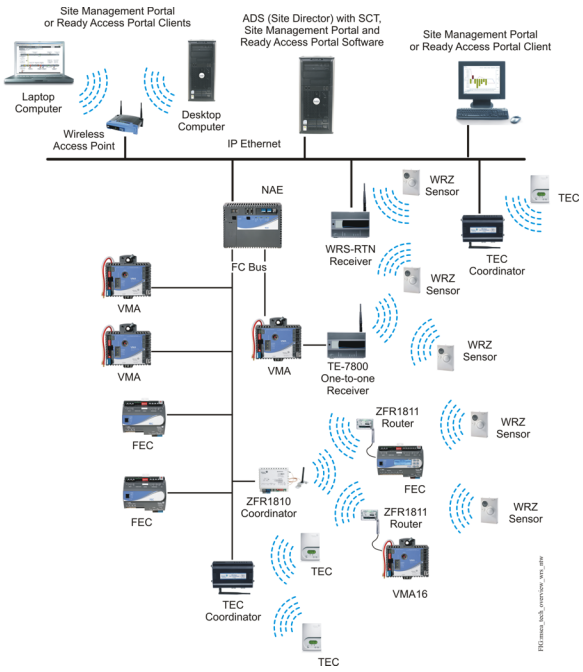
Figure 11: Metasys System Extended Architecture UL864 UUKL Ninth Edition Smoke Control System



Wireless Metasys System Configurations

Figure 12 shows the various wireless Metasys system offerings, and illustrates how the systems can coexist with each other within the Metasys system.

Figure 12: Wireless Metasys Systems



Performance Guidelines and Limitations

Table 3 describes performance guidelines and limitations of the Metasys system extended architecture.

Table 3: Performance Guidelines and Limitations

Description	Supported	Comment
Maximum number of nodes (NAE/NIE/NCE/ADS/ADX) per site	10 to 14	ADS
	500 to 1,000	ADX - depends on computer hardware; see *Large ADX Site Configuration*.
Maximum number of Metasys (only) MS/TP Devices on an FC Bus on an NAE55, NAE45, or NAE45-Lite	100	Metasys MS/TP devices include FECs, VMAs, and IOMs.
Maximum number of (Metasys and/or third-party MS/TP) devices that can be connected to an FC Bus (on an NAE45 or NAE55) when one or more TEC26 Thermostat Controller, variable speed drive, or third-party MS/TP device is connected to the FC bus	64	
Maximum number of Metasys MS/TP devices on an FC Bus on an NAE35	50	Metasys MS/TP devices include FECs, VMAs, and IOMs.
Maximum number of Metasys MS/TP devices on an FC Bus on an NCE25	32	
Maximum number of N2 devices per N2 trunk on an NAE55/NAE45	100	Performance varies based on mix (N2 Open/Sys91/VMA).
Maximum number of N2 devices on the N2 trunk on an NAE35	50	Performance varies based on mix (N2 Open/Sys91/VMA).
Maximum number of N2 devices per N2 trunk on an NCE25	32	
Maximum number of mapped N2 points per N2 trunk	1,000	Performance varies based on mix (N2 Open/Sys91/VMA). Recommended maximum for best performance is 1,000 points. The software definition limit is 3,200 points with no guarantee of acceptable performance.
Maximum number of LonWorks devices per NAE55	255	Single subnet LonWorks network: does not support routers; supports physical repeaters.
Maximum number of LonWorks devices per NAE45	128	Single subnet LonWorks network: does not support routers; supports physical repeaters.
Maximum number of LonWorks devices per NAE35	64	Single subnet LonWorks network: does not support routers; supports physical repeaters.
Maximum number of LonWorks devices per NCE25	32	
Maximum number of LonWorks network variables per NAE55	2,000	
Maximum number of LonWorks network variables per NAE45/NAE35/NCE25	1,500	
Maximum number of BACnet IP devices per NAE55/NAE45/NCE25	100	Includes N30s, third-party devices.

Table 3: Performance Guidelines and Limitations

Description	Supported	Comment
Maximum number of Excel 5000 C-Bus devices on the C-Bus trunk on an NIE55 with UXB	30	The NIE counts as one of the 30 devices. E-Bus devices do not count as one of the 30 devices.
Maximum number of points per C-Bus trunk	2,500	The total point count of the E-Bus devices counts toward the 2,500 point limit.
Maximum number of items (objects) in entire system	3,000,000	Without Metasys Advanced Reporting system and Metasys Energy Essentials.
	750,000	With Metasys Advanced Reporting system and Metasys Energy Essentials.
Maximum number of items (objects) in one NAE85/NIE85/LCS85	25,000	Includes all points, extensions, graphics (background image), trend study, and other objects (schedules and interlock, for example).
Maximum number of items (objects) in one NAE55/NIE55	5,000	Includes all points, extensions, graphics (background image), trend study, and other objects (schedules and interlock, for example).
Maximum number of items (objects) in one NAE45/NAE35/NCE25	2,500	Includes all points, extensions, graphics (background image), trend study, and other objects (schedules and interlock, for example).
Maximum number of items (objects) within a single folder per NIE85/NAE55/NIE55	700	
Maximum number of items (objects) within a single folder per NAE45/NAE35/NCE25	300	
Maximum number of audits per hour for each NAE85/NIE85	500	Add ADS/ADX for more.
Maximum number of audits per hour for each NAE55/NIE55	500	Add ADS/ADX for more.
Maximum number of audits per hour for each NAE45/NAE35/NCE25	250	Add ADS/ADX for more.
Maximum number of alarms/events received by ADX per hour	1,000	Supports one daily burst of 25,000 alarms/events in one hour. This number applies to alarms/events originating from devices at Release 5.2 or later.
Maximum number of alarms/events received by ADX per day	48,000	Within a 24 hour period. This number applies to alarms/events originating from devices at Release 5.2 or later
Maximum number of trend samples received by ADS/ADX per hour	22,500 for ADS	This number applies to trends originating from devices at Release 5.0 or later.
	100,000 for ADX	Supports one daily burst of 300,000 trends in one hour. This number applies to trends originating from devices at Release 5.0 or later.
Maximum number of trend samples received by ADS/ADX per day	540,000 for ADS	Within a 24 hour period for samples originating from devices at Release 5.0 or later.
	2,600,000 for ADX	Within a 24 hour period for samples originating from devices at Release 5.0 or later.

Table 3: Performance Guidelines and Limitations

Description	Supported	Comment
Maximum number of trend samples per NAE85/NIE85	8,000,000	This is a hard limit in the NxE85 and cannot be exceeded.
Maximum number of engines/servers on a site with an ADS Site Director	10 to 14	Varies with the number of concurrent connections (users/devices browsing to the system).For example, with 5 concurrent connections, the maximum number is 10 engines/servers. With 1 concurrent connection, the maximum number is 14 engines/servers.
Maximum number of engines on a site with an ADS-Lite-E Site Director	5	ADS-Lite-E supports up to 5 of the following engines: NAE35, NAE45, NCE25, and NIE29/39/49
Maximum number of engines on a site with an ADS-Lite-A Site Director	4	ADS-Lite-A supports up to 3 NAE-Lites plus up to 1 NIE: NIE29/39/49
Maximum number of engines on a site with an ADX Site Director	500 to 1000	Depends on computer hardware; see *Large ADX Site Configuration*.
Maximum number of engines on a site supported by an NxE55/NxE85 as Site Director	4	If an NxE55 or NxE85 is the Site Director, it can supervise up to three additional supervisory devices on the site: NAE35s, NAE45s (excluding NAE45-Lite), or NxE55s, or NxE85s.
Maximum number of engines on a site supported by an LCS85 as Site Director	10	With an LCS85 as a Site Director.
Maximum number of engines on a site supported by an NAE35/NAE45 as Site Director	3	If an NAE45 is the Site Director, it can supervise up to two additional supervisory devices on the site: NAE45s, NAE35s, or NCE25s (excluding NAE45-Lite). If an NAE35 is the Site Director, it can supervise up to two additional NAE35s or NCE25s on the site. The NAE45-Lite cannot be a Site Director.
Maximum number of engines on a site supported by an NCE25 as Site Director	1	An NCE25 can only act as the Site Director for itself.
Maximum number of simultaneous Site Management Portal users per NAE45/NAE35/NCE25	2	Includes browsers or other devices accessing data (for example, Site Director).
Maximum number of simultaneous Site Management Portal users per NAE55/NIE55 before ADS as Site Director is required	4	Includes browsers or other devices accessing data (for example, Site Director).
Maximum number of simultaneous Site Management Portal users per NAE85/NIE85	10	Includes browsers or other devices accessing data (for example, Site Director).
Maximum number of simultaneous Site Management Portal users per ADS	5	
Maximum number of connections per ADX	10 to 25	ADX has two versions with 10 and 25 connections (maximum).
Maximum number of simultaneous browsers per client computer	2	Mix of online/SCT/simulation
Maximum number of users per Site Director	>	Limited only by the number of users.

Table 3: Performance Guidelines and Limitations

Description	Supported	Comment
Maximum number of user views per Site Director or NAE/NIE	>	Limited only by memory capacity.
Maximum number of nesting levels for item/object creation	7	
Maximum number of extensions per object	10	Includes Metasys Alarm, Totalization, Trend, Averaging, and Load. Does not include BACnet Intrinsic Alarm.
Maximum number of dynamic values per graphic	100	
Maximum number of characters in the name of an item (object)	400	Readable display up to 40 before truncation.
Maximum number of characters in the description of an item (object)	40	
Maximum number of results displayed in a global search	2,000	With an ADX as the Site Director.
	500	With an NAE as the Site Director.
Maximum number of sets for third-party BACnet states text	1,000	
Maximum number of characters for a third-party BACnet states text	60	
Maximum number of members for a multi-value third-party BACnet states text	500	
Number of Users for SCT	1 user per database at a time	Refers to active users.
Maximum number of concurrently active archives in SCT	10	Databases can be archived and restored.
Maximum size of an Active Database or Project in SCT	4 GB	Using supported SQL Server 2008 Express software or SQL Server 2005 Express software
	10 GB	Using supported SQL Server 2008 Express R2 software
	No limit	Using supported SQL Server software
Maximum number of languages per NAE/NIE/NCE	1	Any one language
Maximum number of languages per ADS/ADX	4	Allows dynamic switching.

Table 3: Performance Guidelines and Limitations

Description	Supported	Comment
Maximum number of concurrent users on the Ready Access Portal UI where the software is installed on a stand-alone computer	100	ADX on Windows Server 2008 R2 OS, Windows Server 2008 OS, or Windows Server 2003 OS
	50	ADS on Windows Server 2008 R2 OS, Windows Server 2008 OS, or Windows Server 2003 OS
	8	ADS on Windows 7 OS or Windows XP OS
		NAE35/NAE45/NAE55/NIE55/NIE59/NCE25 on Windows 7 OS, Windows XP, Windows Server 2008 R2 OS, Windows Server 2008 OS, or Windows Server 2003 OS
		NAE85/NIE85 on Windows Web Server 2008 R2 OS, Windows Web Server 2008 OS, or Windows Server 2003 Web Edition OS
Maximum number of concurrent users on the Ready Access Portal UI where the software is installed on a Site Director ADS/ADX	10	ADX (10) on Windows Server 2008 R2 OS, Windows Server 2008 OS, or Windows Server 2003 OS
	25	ADX (25) on Windows Server 2008 R2 OS, Windows Server 2008 OS, or Windows Server 2003 OS
	5	ADS on Windows 7 OS or Windows XP OS
Maximum number of load extensions (used for DLLR)	>	Limited only by memory capacity. If you plan to attach a large number of load extensions to a single DLLR object, consider the memory limitation. For load extensions attached to one DLLR object, there is a 64 KB text limit for the list of the Loads' fully qualified references. Load Limit = (64 x 1024)/average number of characters per load. **Note:** 1024 Bytes equals 1 KB. For example, if your DLLR object is configured with Loads that have fully qualified references that average 100 characters (including dots) in length, then you can support approximately 650 loads (64 x 1024/100) for that DLLR. If you reach the memory limit you may need to combine loads. For example, if a site has multiple physical meters, split the meters across multiple controllers and apply appropriate DLLR loads, if possible. Otherwise, use Interlock or Multiple Command objects to reduce the number of loads added to the DLLR.
Maximum number of DLLR objects	>	Limited only by memory capacity.

Technical Specifications and Requirements

Hardware Configuration Requirements

Our suggested minimum hardware configuration is based upon experience and testing for both client and server platforms. These configurations are only suggestions and are not meant to imply that older or slower machines are not usable. Systems with less memory, smaller hard disks, or that are generally slower may have acceptable performance for basic operations. These systems may also be acceptable when not called upon to operate simultaneous tasks that require hardware or network resources. Memory intensive applications may require additional memory for proper performance. Examples of these optional or advanced features of the Metasys system include navigation and support for complex graphics, operation with the maximum number of users, complex and extended queries with the Export Utility, support for large network integrations, and large numbers of concurrent open windows.

Computer Requirements for Site Management Portal Client Computer

Table 4 and *Table 5* describe the recommended and minimum computer requirements for the computer used for Site Management Portal access.

Table 4: Site Management Portal Desktop Client Computer Requirements

Component	Description
Recommended Processor[1]	2.8 GHz or higher Pentium® 4 processor (2.0 GHz Pentium 4 processor minimum)
Recommended Random Access Memory (RAM)	1 GB (256 MB minimum)[2]
Hard Disk Capacity	40 GB hard disk (minimum)
Supported Operating System	Microsoft® Windows® 7 OS (32-bit) with SP1
	Microsoft® Windows XP® OS (32-bit)
Required Web Browser Software for Metasys Client Computers	Microsoft Internet Explorer® Version 6.x, 7.0, or 8.0 Java® Runtime Environment (JRE) 1.6.0_23
Monitor	1024 x 768 or higher resolution and 16-bit or higher color depth

1 Our computer platform and memory recommendations are not meant to imply that older or slower machines are not usable. Refer to the *Network and IT Guidance for the BAS Professional Technical Bulletin (LIT-12011279)* for more information regarding computer/server recommendations.

2 A graphics intensive user may experience better performance with additional RAM.

Table 5: Site Management Portal Laptop Client Computer Requirements

Component	Description
Recommended Processor[3]	1.8 GHz or higher Pentium® 4 processor (800 MHz Pentium 4 processor minimum)
Recommended Random Access Memory (RAM)	1 GB (256 MB minimum)[4]
Hard Disk Capacity	40 GB hard disk (minimum)
Supported Operating System	Microsoft® Windows® 7 OS (32-bit) with SP1
	Microsoft® Windows XP® OS (32-bit)
Required Web Browser Software for Metasys Client Computers	Microsoft Internet Explorer® Version 6.x, 7.0, or 8.0 Java® Runtime Environment (JRE) 1.6.0_23

3 Our computer platform and memory recommendations are not meant to imply that older or slower machines are not usable. Refer to the *Network and IT Guidance for the BAS Professional Technical Bulletin (LIT-12011279)* for more information regarding computer/server recommendations.

4 A graphics intensive user may experience better performance with additional RAM.

The Microsoft Windows 7 Operating System (OS) does not support browsing to applications with Java Runtime Environment (JRE) version 1.6.0_15 or earlier. If the client computer you use to browse to Metasys systems has a Windows 7 OS, you may not be able to connect directly and browse to some of the older Metasys devices on your Metasys systems.

ADS System Requirements

Table 6 describes the recommended and minimum computer requirements for a computer on which you are installing an ADS.

Table 6: Application and Data Server System Requirements

Product Code	MS-ADS05U-0: New ADS project software for up to 5 concurrent users
Recommended Computer Platform[1]	2.8 GHz Pentium® 4 processor with 80 GB hard disk (2.0 GHz Pentium 4 processor with 40 GB hard disk minimum) 20 GB free space on the hard disk (C: drive) after installing all prerequisite software and before installing the ADS software DVD drive **Note:** Prerequisite software includes the supported OS, database software, .NET Framework, and any other software or service packs required for your ADS configuration.
Recommended Memory	2 GB RAM minimum
Supported Operating Systems	**Microsoft® Windows® 7 OS Professional, Enterprise, and Ultimate Editions (32-bit) with SP1** (Includes Microsoft IIS Version 7.5) Supports Microsoft SQL Server™ 2008 Express R2 software, SQL Server 2008 Express software with SP2, or SQL Server 2005 Express software with SP3
	Microsoft Windows XP® OS Professional Edition (32-bit) with SP3 (Includes Microsoft IIS Version 5.1) Supports Microsoft SQL Server 2008 Express R2 software, or SQL Server 2008 Express software with SP2, or SQL Server 2005 Express software with SP3
Required Web Browser Software for Metasys Client Computers	Microsoft Internet Explorer® Version 6.x, 7.0, or 8.0 Java® Runtime Environment (JRE) 1.6.0_23 **Note:** When browsing to the UI of a Metasys system device, the OS on the client computer must be supported by the Metasys release loaded on the device. You may be unable to browse to Metasys system devices if the client OS is not supported. See *Computer Requirements for Site Management Portal Client Computer* for more information.
Network Communication	Ethernet network interface card 10/100/1000 Mbps (100 Mbps or better recommended)
Additional Software Included on the ADS Product Disks	CCT software Export Utility software Metasys Database Manager software Microsoft .NET Framework Version 3.5.1 Microsoft SQL Server 2008 Express R2 software Microsoft SQL Server 2008 Express software with SP2 Microsoft SQL Server 2005 Express software with SP3 Ready Access Portal software SCT software SCT Manager software
Optional Hardware	Any network or local printer supported by the qualified Windows operating system

[1] Our computer platform and memory recommendations are not meant to imply that older or slower machines are not usable. Refer to the *Network and IT Guidance for the BAS Professional Technical Bulletin (LIT-12011279)* for more information regarding computer/server recommendations.

[2] Refer to the *Network and IT Guidance for the BAS Professional Technical Bulletin (LIT-1201279)* for specific Microsoft Windows OS settings that may be required for your Metasys system configuration.

ADS-Lite System Requirements

Table 7 describes the recommended and mimum computer requirements for the computer on which you are installing an ADS-Lite.

Table 7: Application and Data Server Lite System Requirements

Product Code	MS-ADSLE5U-0: New ADS-Lite-E project software for up to 5 concurrent users MS-ADSLA5U-0: New ADS-Lite-A project software for up to 5 concurrent users
Recommended Computer Platform[1]	2.8 GHz Pentium® 4 processor with 80 GB hard disk (2.0 GHz Pentium 4 processor with 40 GB hard disk minimum) 20 GB free space on the hard disk after installing all prerequisite software and before installing the ADS-Lite software DVD drive **Note:** Prerequisite software includes the supported OS, database software, .NET Framework, and any other software or service packs required for your ADS-Lite configuration.
Recommended Memory	2 GB RAM minimum
Supported Operating Systems[2] and Database Software	**Microsoft® Windows® 7 OS Professional, Enterprise, and Ultimate Editions (32-bit) with SP1** (Includes Microsoft IIS Version 7.5) Supports Microsoft SQL Server™ 2008 Express R2 software, SQL Server 2008 Express software with SP2, or SQL Server 2005 Express software with SP3
	Microsoft Windows XP® OS Professional Edition (32-bit) with SP3 (Includes Microsoft IIS Version 5.1) Supports Microsoft SQL Server 2008 Express R2 software, or SQL Server 2008 Express software with SP2, or SQL Server 2005 Express software with SP3
Required Web Browser Software for Metasys Client Computers	Microsoft Internet Explorer® Version 6.x, 7.0, or 8.0 Java® Runtime Environment (JRE) 1.6.0_23 **Note:** When browsing to the UI of a Metasys system device, the OS on the client computer must be supported by the Metasys release loaded on the device. You may be unable to browse to Metasys system devices if the client OS is not supported. See *Computer Requirements for Site Management Portal Client Computer* for more information.
Network Communication	Ethernet network interface card 10/100/1000 Mbps (100 Mbps or better recommended)
Additional Software Included on the ADS Product Disks	CCT software Export Utility software Metasys Database Manager software Microsoft .NET Framework Version 3.5.1 Microsoft SQL Server 2008 Express R2 software Microsoft SQL Server 2008 Express software with SP2 Microsoft SQL Server 2005 Express software with SP3 Ready Access Portal software SCT software SCT Manager software
Optional Hardware	Any network or local printer supported by the qualified Windows operating system

[1] Our computer platform and memory recommendations are not meant to imply that older or slower machines are not usable. Refer to the *Network and IT Guidance for the BAS Professional Technical Bulletin (LIT-12011279)* for more information regarding computer/server recommendations.

[2] Refer to the *Network and IT Guidance for the BAS Professional Technical Bulletin (LIT-1201279)* for specific Microsoft Windows OS settings that may be required for your Metasys system configuration.

ADX System Requirements

Table 8 describes the recommended and minimum computer requirements for the computer on which you are installing a unified ADX.

Table 9 describes the recommended and minimum computer requirements for the computers on which you are installing a split ADX.

Table 8: Extended Application and Data Server System Requirements (Unified ADX Systems)

Product Codes	MS-ADX10U-0: New ADX project software for up to 10 concurrent users
	MS-ADX10SQL-0: New ADX project software for up to 10 concurrent users Includes Microsoft® SQL Server™ 2008 software with a Processor License for unlimited users/devices
	MS-ADXSWO-0: New ADX project software for up to 25 concurrent users
	MS-ADXSWOSQL-0: New ADX project software for up to 25 concurrent users Includes Microsoft SQL Server 2008 software with a Processor License for unlimited users/devices
Recommended Server Platform[1]	2.8 GHz Pentium® 4 processor with 160 GB hard disk (2.0 GHz Pentium 4 processor with 80 GB hard disk minimum) 40 GB free space on the hard disk installing the prerequisite software and before installing the ADX software DVD drive
Recommended Memory	4 GB RAM minimum
Supported Operating Systems[2] and Database Software[3]	**Microsoft Windows Server 2008 R2 OS (64-bit)** (Includes Microsoft IIS Version 7.5) Supports Microsoft SQL Server™ 2008 R2 Standard and Enterprise software (64 bit)
	Microsoft Windows Server 2008 OS (32-bit) with SP2 (Includes Microsoft IIS Version 7.0) Supports Microsoft SQL Server 2008 R2 Standard and Enterprise software, SQL Server™ 2008 Standard and Enterprise software with SP2, or SQL Server™ 2005 Standard and Enterprise software with SP3 (32-bit)
	Microsoft Windows Server 2003 R2 OS (32-bit) with SP2 (Includes Microsoft IIS Version 6.0) Supports Microsoft SQL Server 2008 R2 Standard and Enterprise software, SQL Server 2008 Standard and Enterprise software with SP2, or SQL Server 2005 Standard and Enterprise software with SP3 (32-bit)
Required Web Browser Software for Metasys Client Computers	Microsoft Internet Explorer® Version 6.x, 7.0, or 8.0 Java® Runtime Environment (JRE) 1.6.0_23 **Note:** When browsing to the UI of a Metasys system device, the OS on the client computer must be supported by the Metasys release loaded on the device. You may be unable to browse to Metasys system devices if the client OS is not supported. See *Computer Requirements for Site Management Portal Client Computer* for more information.
Network Communication	Ethernet network interface card 10/100/1000 Mbps (100 Mbps or better recommended)

Table 8: Extended Application and Data Server System Requirements (Unified ADX Systems)

Additional Software Included on the ADX Product Disks	CCT software Export Utility software Metasys Advanced Reporting System Metasys Database Manager software Microsoft .NET Framework Version 3.5 SP1 or 3.5.1 (Windows Server 2008 R2 software) Ready Access Portal software SCT software SCT Manager software
Optional Hardware	Any network or local printer supported by the qualified Windows operating system

1 Our computer platform and memory recommendations are not meant to imply that older or slower machines are not usable. Refer to the *Network and IT Guidance for the BAS Professional Technical Bulletin (LIT-12011279)* for more information regarding computer/server recommendations.

2 Refer to the *Network and IT Guidance for the BAS Professional Technical Bulletin (LIT-1201279)* for specific Microsoft Windows OS settings that may be required for your Metasys system configuration.

3 You must purchase a SQL Server software license for each individual processor you have. You do not need to purchase multiple licenses if you have a single processor divided into multiple cores. For example, if you have a single processor with dual cores, purchase one license for SQL Server software.

Table 9: Extended Application and Data Server System Requirements (Split ADX Systems)

Product Codes	MS-ADX10U-0: New ADX project software for up to 10 concurrent users
	MS-ADX10SQL-0: New ADX project software for up to 10 concurrent users Includes Microsoft® SQL Server™ 2008 software with a Processor License for unlimited users/devices[4]
	MS-ADXSWO-0: New ADX project software for up to 25 concurrent users
	MS-ADXSWOSQL-0: New ADX project software for up to 25 concurrent users Includes Microsoft SQL Server 2008 software with a Processor License for unlimited users/devices[4]
Recommended Server Platform[5]	**Web/Application Server Computer** 2.8 GHz Pentium® 4 processor with 160 GB hard disk (2.0 GHz Pentium 4 processor with 80 GB hard disk minimum) DVD drive 200 MB free space on the hard disk after installing the prerequisite software and before installing the ADX software.
	Database Server Computer 2.8 GHz Pentium® 4 processor with 160 GB hard disk (2.0 GHz Pentium 4 processor with 80 GB hard disk minimum) DVD drive 40 GB free space on the hard disk after installing the prerequisite software and before installing the ADX software
	SCT Manager In a split configuration, you cannot install the SCT on either the Web/Application Server computer or the Database Server computer. Refer to the *System Configuration Tool Catalog Page (LIT-1900198)* for current SCT computer requirements.
Recommended Memory	4 GB RAM minimum

Table 9: Extended Application and Data Server System Requirements (Split ADX Systems)

Supported Operating Systems[7],[8] and Database Software[9]	**Microsoft Windows Server 2008 R2 OS (64-bit)** (Includes Microsoft IIS Version 7.5) Supports Microsoft SQL Server™ 2008 R2 Standard and Enterprise software (64-bit)
	Microsoft Windows Server 2008 OS (32-bit) with SP2 (Includes Microsoft IIS Version 7.0) Supports Microsoft SQL Server 2008 R2 Standard and Enterprise software, SQL Server™ 2008 Standard and Enterprise software with SP2, or SQL Server™ 2005 Standard and Enterprise software with SP3 (32-bit)
	Microsoft Windows Server 2003 R2 OS (32-bit) with SP2 (Includes Microsoft IIS Version 6.0) Supports Microsoft SQL Server 2008 R2 Standard and Enterprise software, SQL Server 2008 Standard and Enterprise software with SP2, or SQL Server 2005 Standard and Enterprise software with SP3 (32-bit)
Required Web Browser Software for Metasys Client Computers	Microsoft Internet Explorer® Version 6.x, 7.0, or 8.0 Java® Runtime Environment (JRE) 1.6.0_23 **Note:** When browsing to the UI of a Metasys system device, the OS on the client computer must be supported by the Metasys release loaded on the device. You may be unable to browse to Metasys system devices if the client OS is not supported. See *Computer Requirements for Site Management Portal Client Computer* for more information.
Network Communication	Ethernet network interface card 10/100/1000 Mbps (100 Mbps or better recommended)
Additional Software Included on the ADX Product Disks	CCT software Export Utility software Metasys Advanced Reporting System Metasys Database Manager software Microsoft .NET Framework Version 3.5 SP1 or 3.5.1 (Windows Server 2008 R2 software) Ready Access Portal software SCT software SCT Manager software
Optional Hardware	Any network or local printer supported by the qualified Windows operating system

4 This product cannot be used in the following situations due to SQL Server software licensing restrictions: a split ADX with the Metasys Advanced Reporting System and computers with more than one processor. Order the ADX software and the appropriate SQL Server software separately.

5 Our computer platform and memory recommendations are not meant to imply that older or slower machines are not usable. Refer to the *Network and IT Guidance for the BAS Professional Technical Bulletin (LIT-12011279)* for more information regarding computer/server recommendations.

6 ADX prerequisite software includes the Windows OS and SQL Server software, Windows .NET Framework, and any other software or service packs required for your ADX configuration.

7 The Web/Application and Database servers must have the same OS installed.

8 Refer to the *Network and IT Guidance for the BAS Professional Technical Bulletin (LIT-1201279)* for specific Microsoft Windows OS settings that may be required for your Metasys system configuration.

9 You must purchase a SQL Server software license for each individual processor you have. You do not need to purchase multiple licenses if you have a single processor divided into multiple cores. For example, if you have a single processor with dual cores, purchase one license for SQL Server software.

SCT System Requirements

Table 10 describes the recommended and minimum computer requirements for a computer on which you are installing a stand-alone SCT.

Table 10: System Configuration Tool System Requirements

Recommended Computer/Server Platform[1]	Intel® Core™ 2 Duo E6700 or better (Intel Core 2 Duo E4300 minimum) 20 GB free hard disk space available (600 MB minimum) DVD drive
Recommended Memory[1]	Computer Platforms: 2 GB RAM (1 GB RAM minimum) Server Platforms: 4 GB RAM (2 GB RAM minimum)
Supported Operating Systems and Database Software	**Microsoft® Windows® 7 OS Professional, Enterprise, and Ultimate Editions (32-bit) with SP1** (Includes Microsoft IIS Version 7.5) Supports SQL Server™ 2008 R2 Express software, SQL Server™ 2008 Express software with SP2, or Microsoft SQL Server™ 2005 Express software with SP3
	Microsoft Windows XP® OS Professional Edition (32-bit) with SP3 (Includes Microsoft IIS Version 5.1)Supports SQL Server 2008 R2 Express software, SQL Server 2008 Express software with SP2, or Microsoft SQL Server 2005 Express software with SP3
	Microsoft Windows® Server 2008 R2 OS (64-bit) (Includes Microsoft IIS Version 7.5) Supports Microsoft SQL Server 2008 R2 Standard and Enterprise software (64-bit)
	Microsoft Windows® Server 2008 OS (32-bit) with SP2 (Includes Microsoft IIS Version 7.0) Supports Microsoft SQL Server 2008 R2 Standard and Enterprise software (32-bit), or SQL Server 2008 Standard and Enterprise software with SP2, or SQL Server 2005 Standard and Enterprise software with SP3
	Microsoft Windows Server 2003 R2 OS (32-bit) with SP2 (Includes Microsoft IIS Version 6.0) Supports Microsoft SQL Server 2008 R2 Standard and Enterprise software (32-bit), or SQL Server 2008 Standard and Enterprise software with SP2, or SQL Server 2005 Standard and Enterprise software with SP3
Required Web Browser Software for Metasys Client Computers	Microsoft Internet Explorer® Version 6.x, 7.0, or 8.0 Java® Runtime Environment (JRE) 1.6.0_23
Network Communication	Ethernet network interface card 10/100 Mbps (100 Mbps network recommended)
Additional Software Included on the SCT Product Disks	Controller Configuration Tool (CCT) software C-Tools software SCT Manager software
Optional Software Packaging	The ADS and ADX software packages include the SCT software.

1 Our computer platform and memory recommendations are not meant to imply that older or slower machines are not usable. Refer to the *Network and IT Guidance for the BAS Professional Technical Bulletin (LIT-12011279)* for more information regarding computer/server recommendations.

CCT System Requirements

Table 11 describes the recommended and minimum computer requirements for a computer on which you are installing a stand-alone CCT.

Table 11: Controller Configuration Tool System Requirements

Recommended Computer/Server Platform[1]	Intel® Core™ 2 Duo E6700 or better (Intel Core 2 Duo E4300 minimum) 20 GB free hard disk available (600 MB minimum) DVD drive
Recommended Memory[1]	Computer Platforms: 2 GB RAM recommended (1 GB RAM minimum) Server Platforms: 4 GB RAM recommended (2 GB RAM minimum)
Supported Operating Systems and Database Software	**Microsoft® Windows® 7 OS Professional, Enterprise, and Ultimate Editions (32-bit) with SP1** (Includes Microsoft IIS Version 7.5) Supports SQL Server™ 2008 Express software with SP1 or Microsoft SQL Server™ 2005 Express software with SP3
	Microsoft Windows XP® OS Professional Edition (32-bit) with SP2 or SP3 (Includes Microsoft IIS Version 5.1) Supports SQL Server 2008 Express software with SP1 or Microsoft SQL Server 2005 Express software with SP3
Required Web Browser Software for Metasys Client Computers	Microsoft Internet Explorer® Version 6.x, 7.0, or 8.0 Java® Runtime Environment (JRE) 1.6.0_23 The Internet Explorer Web browser is required to use the CCT Help.
Network Communication	Ethernet network interface card 10/100 Mbps (100 Mbps network recommended)
Additional Software Included on the ADS, ADX, or SCT Product Disks	Microsoft .NET Framework Version 3.5 with SP1 System Configuration Tool (SCT) software for Ethernet Passthru **Note:** You must install CCT on the same computer as the SCT software to use the Ethernet Passthru option in SCT; otherwise, CCT may run on a stand-alone computer.
Additional Requirements (Order Separately)	Wireless Commissioning Converter (MS-BTCVT-1) Laptop with Bluetooth® wireless communications or a computer with a Universal Serial Bus (USB) Bluetooth converter Universal Serial Bus (USB) Dongle with ZigBee Driver (IA OEM-DAUB1 2400) provides a wireless connection through the CCT to allow wireless commissioning of the wirelessly enabled FEC and VMA16 field controllers. Also allows use of the ZCT in CCT. Adobe® Acrobat Reader **Note:** Adobe Acrobat Reader is required for the Print function in CCT.
Optional Hardware	Any network or local printer supported by the qualified Windows operating system

[1] Our computer platform and memory recommendations are not meant to imply that older or slower machines are not usable. Refer to the *Network and IT Guidance for the BAS Professional Technical Bulletin (LIT-12011279)* for more information regarding computer/server recommendations.

NxE85 System Requirements

Table 12 describes the recommended and minimum computer requirements for a computer on which you are installing an NxE85.

Table 12: NxE85 Software System Requirements

Product Code	MS-NxE85SW-0	NxE85 software for 10,000 objects (new projects only software)
Recommended Computer Platform	Intel® Xeon® E5506, 2.13 GHz, 4 MB Cache 2 x 160 GB 7.2K RPM Serial Advanced Technology Attachment (SATA), 8.9 cm (3.5 in.) Cabled 3 Gbps, RAID 1 configuration with add-in SAS6/iR (SATA/SAS Controller) DVD ROM, SATA	
Recommended Memory	1 GB RAM minimum	
Hard Disk	160 GB minimum	
Supported Operating Systems and Software	**Microsoft Windows Web Server R2 2008 OS (64-bit)** Microsoft IIS Version 7.5 Microsoft .NET Framework Version 3.5.1	
	Microsoft Windows Web Server 2008 OS with SP2 (32-bit) Microsoft IIS Version 7.0 Microsoft .NET Framework Version 3.5 with SP1	
	Microsoft® Windows® 2003 Web Edition OS with SP2 (32-bit) Microsoft IIS Version 6.0 Microsoft .NET Framework Version 3.5 with SP1	
Network Communication	Network Interface Single 1 Gbps Ethernet network interface card 10/100/1000 Mbps (100 Mbps or better recommended)	
Recommended Data Protection	Uninterruptible Power Supply (UPS): American Power Conversion (APC®) Smart-UPS SC 450 VA, 280 W, 120 VAC input/output, NEMA 5-15R output connections, OEM Part No. SC450RM1U	

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